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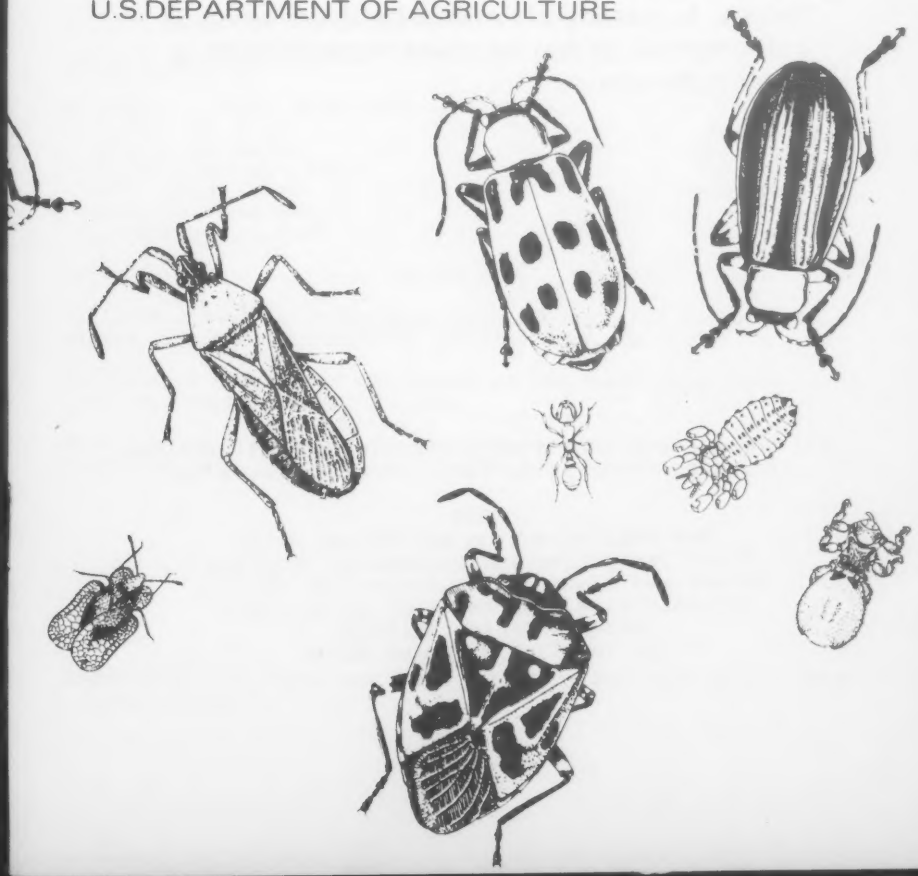

ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE PROGRAMS
NEW PEST DETECTION AND SURVEY STAFF

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Service serves as a clearing house and does not assume responsibility for accuracy of the material.

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COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG infestations in wheat in southwest Oklahoma decreased due to rain and cold weather; infestations light in small grains in Rolling Plains of Texas (p. 207).

ALFALFA WEEVIL larval tip infestations ranged to heavy on alfalfa in southwest Oklahoma, caused extensive damage to clover in limited area of north-central Texas. (p. 207).

BOLL WEEVIL survival highest since 1969 in Mississippi. (p. 208).

Predictions

Population "explosion" of SOUTHERN HOUSE MOSQUITO and other mosquitoes expected in Alabama. (p. 209).

Detection

For new county records see pages 211, and 233-236.

Special Reports

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- Misc. Field Crops. (p. 218).
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- Beans and Peas. (p. 222).
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Recognition Characters for Larvae of the Genus Zonosemata (Diptera, Tephritidae). (p. 231).

Distribution Records of Several Virginia Shield Bugs (Hemiptera: Scutelleridae, Corimelaenidae, Cydnidae, Pentatomidae). (p. 233).

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NATIONAL WEATHER SERVICE 30-DAY OUTLOOK
MID-MARCH TO MID-APRIL 1975

The National Weather Service's 30-day outlook for mid-March to mid-April is for temperatures to average below seasonal normals in the northeastern quarter of the Nation and above normal in the Southwest. In unspecified areas near-normal temperatures are in prospect. Precipitation is expected to exceed the median value in much of both the Pacific Northwest and northern Great Plains as well as the Midwest and the Southeast. Elsewhere less than the median amount is expected.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the National Weather Service. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price $5.00 a year.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

GREENBUG (Schizaphis graminum) - OKLAHOMA - Decreased in wheat in Harmon, Greer, Jackson, Kiowa and Tillman Counties due to rain and cold weather. Ranged light to moderate in most fields, 90-190 per linear foot in few scattered fields. Counts per linear foot by county: Washita 75, Grady 15-20, Garvin 15. Light to moderate in Comanche County. Light parasite and predator activity reported in most of these counties. (Okla. Coop. Sur.). TEXAS - Populations light in small grains in Cottle, King, Wichita, and Wilbarger Counties. Infestations ranged from very few to 62 per drill row foot. Infestations light to heavy in Archer, Baylor, Childress, Hardeman, Jones, Knox, Throckmorton Counties; ranged 9-250 per drill row foot. Treatments applied in parts of Childress and Wilbarger Counties. (Boring). NEW MEXICO - Ranged 6-12 per linear foot on grazed wheat and 50-100 per linear foot on ungrazed wheat appearing in Roosevelt and Curry Counties. (N.M. Coop. Rpt.).

CORN LEAF APHID (Rhopalosiphum maidis) - NEW MEXICO - Ranged 50-75 per linear foot in field of wheat near Clovis, Curry County. (N.M. Coop. Rpt.).

CORN, SORGHUM, SUGARCANE

SOUTHWESTERN CORN BORER (Diatraea grandiosella) - KANSAS - Overwintering larvae found in 1974-crop sorghum stalks in Stafford County field. Externally, stalks showed little evidence of infestation. Larvae constructed short, 3 to 5-inch tunnels inside lower portions of stalks; had not tunneled as near bases of stems as typically found in corn. No girdling or lodging as in corn; extent of infestation not yet known. (Bell).

SMALL GRAINS

ENGLISH GRAIN APHID (Macrosiphum avenae) - ALABAMA - Very heavy infestation of 10-100 per clump of plants active over entire 250-acre field of wheat in Tuscaloosa County. Controls planned. (Pitts).

LYGUS BUGS (Lygus spp.) - NEW MEXICO - Counts of one per linear foot recovered from wheat near Clovis, Curry County. Lady beetles active in this field with up to 2 per linear foot counted. (N.M. Coop. Rpt.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - OKLAHOMA - Egg counts taken March 1 in several northwest and panhandle counties ranged from 32 per square foot in Cimarron County to 306 per square foot in Woods County. Counts taken March 7 showed 78 larvae per square foot in Muskogee County, 352 larvae per square foot in Grady County, 75 eggs and 98 larvae per square foot (38 percent of terminals infested) in Garvin County, and 48 eggs and 151 larvae per square foot (66 percent of terminals infested) in Stephens County. Current counts in Harmon, Greer, and Jackson Counties showed terminal infestations of 30-90 percent with 2-8 larvae per terminal in some fields. Light to moderate infestations reported in Comanche County. (Okla. Coop. Sur.). TEXAS - Caused extensive damage to clover in Colorado County. (Cole). ARKANSAS - Survey

for alfalfa weevil in crimson clover negative along right-of-way of U.S. Interstate Highway 40 in west-central area. (Boyer). MISSOURI - No activity observed in 5 alfalfa fields checked in west-central area. (Munson).

CLOVER LEAF WEEVIL (Hypera punctata) - MISSOURI - Light in alfalfa and red clover in the west-central area; ranged 0-6 larvae per crown in alfalfa and 0-9 in red clover. (Munson).

PEA APHID (Acyrthosiphon pisum) - NEW MEXICO - Ranged 4-10 per square foot in young alfalfa near Roswell, Chaves County. (N.M. Coop. Rpt.). OKLAHOMA - Moderate in alfalfa in Harmon, Greer, and Jackson Counties. (Okla. Coop. Sur.). ARKANSAS - Survey negative in crimson clover along U.S. Interstate Highway 40 right-of-way in west-central area. (Boyer).

WEBWORMS (Loxostege spp.) - NEW MEXICO - Some activity noted in alfalfa near Roswell, Chaves County. Larvae averaged less than 2 per square yard in two fields. (N.M. Coop. Rpt.).

COTTON

Boll Weevil Survival Survey - Spring 1975
Washington County, Mississippi

Spring collections of surface ground trash samples (two square yards per sample) were made February 26 in Washington County, Mississippi, to determine the number of boll weevil (Anthonomus grandis) adults per acre of ground trash examined and the percent survival. For purposes of this survey, 3 samples were taken from each of 8 locations in the county that were sampled in fall 1974. Fall collections were made November 21, 1974, but no boll weevils were found.

The average number of boll weevils per acre in spring 1975 was 505, the highest average since 1969. It is also more than the average for the past 9 years. Percent survival could not be calculated since no weevils were found in samples collected in fall 1974.

It is believed that at time of sampling last fall boll weevils were dispersed throughout available ground trash, but by time spring samples were collected, excessive ground moisture had forced them onto higher spots. The winter of 1974-1975 has been very wet with 21.17 inches of rain during the period between fall and spring collections.

The winter of 1974-1975 has not been very cold. Minimum temperatures at Stoneville (Washington County) were 17 degrees F. January 13 and 19 degrees F. January 14. The next lowest temperature was 24 degrees F. December 9, and February 7 and 10. (Pfrimmer et al.).

BOLLWORMS (Heliothis spp.) - NORTH CAROLINA - Total losses plus cost of controlling H. zea (bollworm) and H. virescens (tobacco budworm) on cotton during 1974 increased despite decrease in acreage. This was due largely to increased chemical costs and poor weather conditions during August and early September. Loss plus cost of control on 172,000 harvested acres in 1973 estimated at 2.2 million dollars compared to 2.5 million dollars on 150,000 harvested acres in 1974. Estimated bollworm loss and control cost per acre increased from $12.79 in 1973 to $16.64 in 1974. (Hunt).

GENERAL VEGETABLES

ONION MAGGOT (Hylemya antiqua) - MISSISSIPPI - Larvae severe in 700-900 onion plants in Lauderdale County. (Cooley, Welch).

CITRUS

MULBERRY WHITEFLY (Tetraleurodes mori) - CALIFORNIA - Eggs, larvae, and pupae heavy on tangerine trees in Redlands, San Bernardino County. (Cal. Coop. Rpt.).

SMALL FRUITS

A BOSTICHID BEETLE (Psoa quadrisignata) - WASHINGTON - Damaged Concord grapevines at Prosser, Benton County. (Cone, March 6).

ORNAMENTALS

SOUTHERN ARMYWORM (Spodoptera eridania) - FLORIDA - Larvae moderate on 50 percent of 150 schefflera plants (Brassaia actinophylla) examined at nursery in Ft. Lauderdale, Broward County, March 6 by K.L. Tyson. Determined by D.H. Habeck. (Fla. Coop. Sur.).

MAN AND ANIMALS

SCREWWORM (Cochliomyia hominivorax) - Total of four cases reported from continental U.S. during period March 2-8, all from Texas. Total of 86 cases confirmed from Mexico. Number of sterile flies released in U.S. this period totaled 24,166,000, all released in Texas. Total of 96,161,400 sterile flies released in Mexico. (Vet. Serv.).

COMMON CATTLE GRUB (Hypoderma lineatum) - OKLAHOMA - Still moderate in backs of cattle checked in Hughes County. (Okla. Coop. Sur.). COLORADO - Larvae averaged 9 per head in untreated cattle in Larimer County. On treated cows, counts ranged 0-20+ per head with most showing none to one per head. (Hantsbarger).

HORN FLY (Haematobia irritans) - ALABAMA - First adults of season on cattle noted on beef cattle in 100-cow herd in Lee County March 11. Two to 5 flies observed on about 25 percent of animals. (McQueen).

SOUTHERN HOUSE MOSQUITO (Culex pipiens quinquefasicatus) - ALABAMA - Occasional adult fed on man and animals in late afternoon in Auburn, Lee County. With mild winter, early spring, and surplus of standing water in various containers over State, population "explosion" of this and other species should occur soon. (McQueen).

CATTLE LICE - OKLAHOMA - Populations, mainly Haematopinus eurysternus (shortnosed cattle louse), reported heavy on cattle in Comanche and Jackson Counties, moderate in Hughes County. (Okla. Coop. Sur.).

BROWN DOG TICK (Rhipicephalus sanguineus) - OKLAHOMA - Ranged 2-3 per ear on several dogs checked in Jefferson County. (Okla. Coop. Sur.).

EAR TICK (Otobius megnini) - KANSAS - Light in ears of four of 28 steers brought into Finney County from Pratt County (treated). (Bell).

HOUSEHOLDS AND STRUCTURES

EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) - ALABAMA - First flights of winged mating forms reported in Selma, Dallas County, past 10 days. (Pelham).

CARPENTER ANTS (Camponotus spp.) - DELAWARE - Several infestations reported in homes past 14-21 days in New Castle County area. (Burbutis).

STORED PRODUCTS

A WEEVIL (Smicronyx sordidus) - NEVADA - Taken from stored Helianthus annuus sunflower) seed at Schurz, Mineral County, August 1, 1974, by R.C. Bechtel, and at Fallon, Churchill County, August 12, 1974, by L.W. Barclay. Determined by R.C. Bechtel. These are new county records. (Bechtel).

MERCHANT GRAIN BEETLE (Oryzaephilus mercator) - NEVADA - Taken at Elko, Elko County, November 4, 1974, from stored nuts by S.D. Peters. Determined by R.C. Bechtel. This is a new county record. (Bechtel).

LESSER GRAIN BORER (Rhyzopertha dominica) - NEVADA - Collected from mill dust at location 5 miles south of Yerington, Lyon County, November 19, 1974, by R.W. Lauderdale. Determined by R.C. Bechtel. This is a new county record. (Bechtel).

BENEFICIAL INSECTS

CONVERGENT LADY BEETLE (Hippodamia convergens) - OKLAHOMA - Moderate in wheat in Grady and Garvin Counties; light in wheat and alfalfa in southwest counties. (Okla. Coop. Sur.). KANSAS - Adults averaged about 2 per drill row foot and very active in wheatfield in Stevens County February 26 at temperature of 54 degrees F. Light Schizaphis graminum (greenbug) infestation reported in field. (Bell).

A BLISTER BEETLE (Meloe niger) - WASHINGTON - Overwintering adults of this predator of Nomia melanderi (alkali bee) first noted emerging from bee beds in Lowden and Touchet area of Walla Walla County February 21. (Mayer, Johansen).

DAMSEL BUGS (Nabis spp.) - OKLAHOMA - Light in alfalfa and wheat in several southwest counties. (Okla. Coop. Sur.).

A BRACONID WASP (Lysiphlebus testaceipes) - OKLAHOMA - Light numbers of parasitized Schizaphis graminum (greenbug) reported in wheat in Harmon, Greer, Jackson, Kiowa, Tillman, Washita, Grady, and Garvin Counties. (Okla. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

WEST INDIAN SUGARCANE ROOT BORER (Diaprepes abbreviatus) - FLORIDA - Larvae infested soil at site where Adonidia sp. or Coccus plumosa palm dug out at nursery in Davie, Broward County. Collected February 25, 1975, by R.L. Chavez. Determined by J. Beavers. Two larvae and one adult infested leaves, roots, and soil of orange tree (Citrus sp.) examined at retail outlet in Forest City, Seminole County, February 27, 1975, by C. Allen and C.E. McKee. Determined by R.E. Woodruff. Seminole is a new county record. Adults moderate in soil around 4 of 40 schefflera plants (Brassaia actinophylla) examined at nursery March 2, 1975, and larvae moderate in soil around 20 of 40 schefflera plants examined at another nursery March 2 in Davie by R.L. Chavez. Determined by J. Beavers. Adults infested soil March 11, 1975, where schefflera had been dug out at another nursery in Davie. Collected by D.C. Clinton. (Fla. Coop. Sur.).

DETECTION

New County Records

EUROPEAN EARWIG (Forficula auricularia) - WISCONSIN - Collected on scuba gear in Dane County June 12, 1974, by S. Smith. Determined by A.B. Gurney. (Wis. Ins. Sur.).

LESSER GRAIN BORER (Rhyzopertha dominica) NEVADA - Lyon (p. 210). MERCHANT GRAIN BEETLE (Oryzaephilus mercator) NEVADA - Elko (p. 210). A WEEVIL (Smicronyx sordidus) NEVADA - Mineral, Churchill (p. 210). WEST INDIAN SUGARCANE ROOT BORER (Diaprepes abbreviatus) FLORIDA - Seminole (p. 211).

CORRECTIONS

CEIR 25(8):80 - VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) should read GREEN CLOVERWORM (Plathypena scabra). Specimens were misidentified. (Fla. Coop. Sur.). On HIGHLIGHT page of same issue (p. 77), delete "VELVETBEAN CATERPILLAR in Florida" under "Some First Appearances of Season."

CEIR 25(8):86 - Line 20: "... a PLATYGASTERID WASP (Amitis hesperidum) ..." should read "... a PLATYGASTERID WASP (Amitus hesperidum) ..."

CEIR 25(10):139 - Third paragraph, line 8: "... Sympiesis viridus ..." should read "... Sympiesis viridula ..."

CEIR 25(10):146 - "STALK BORER (Papipema nebris) ..." should read "STALK BORER (Papaipema nebris) ..."

General Vegetables - All stages of GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) moderate to heavy on snap beans and cucumbers at Kona, Hawaii Island, and at Waimanalo, Oahu Island. Light on 2 acres of cucumber at Kona and on harvest-age snap beans at Waimanalo. LEEK MOTH (Acrolepia assectella) larvae ranged moderate to heavy on green onions at several locations in Hilo area, Hawaii Island; 30-60 percent of leaves damaged. (Mau).

Fruits and Ornamentals - Single adult of a NOCTUID MOTH (Anua indiscriminata) collected at Kaiku, Maui, in late February 1975. Collector not given. This is a new island record. This noctuid has now been recorded from Oahu, Kauai, Maui, and Hawaii Islands. Light foliage damage observed in 3+ acres of guava at Waimanalo, Oahu. No larvae found. (Miyahira, Mau). Detection surveys for BANANA SKIPPER (Erionota thrax) conducted at Kona, Hawaii Island, and at Paia, Haiku, and Hana, Maui Island, revealed no infestations. Infestations on increase on Kauai. Records indicate increase in amount of host material collected during parasite evaluation surveys. (Miyahira et al.).

Forest and Shade Trees - FORMOSAN SUBTERRANEAN TERMITE (Coptotermes formosanus) infested live Java plum tree (Eugenia cumini) in Waiahole Valley, Oahu. Many workers and soldiers under bark. This may be new host record for State. (Fujii). Light infestation of a BARK BEETLE (Xylosandrus compactus) reported from Clidemia in Ewa Forest Reserve, Oahu. Infestation spotty along Schofield-Waikane and Mauka Ditch Trails. Dieback of infested plants observed; some dead plants were 6 feet high. (Pelly).

Beneficial Insects - A MINUTE EGG PARASITE (Trichogramma sp.) parasitized eggs of Deilephila nerii (oleander hawk moth); 5 of 12 eggs collected at Kaimuki, Oahu, were parasitized. Trichogramma sp. adults emerged from 2 eggs. (Kahale, Au). Parasite evaluation surveys for Erionota thrax (banana skipper) parasites, an ENCYRTID WASP (Ooencyrtus erionotae) and a BRACONID WASP (Apanteles erionotae) conducted at 11 locations on Kauai during February 1975 indicated both species are established. Parasites reared from host material collected at Hanapepe, Kaumakani, and Kapaia. Parasitism by O. erionotae was 8.5 and 5 percent at Kaumakani and Kapaia, respectively. Parasitism by A. erionotae was 25 percent at Hanapepe. (Ragasa, Melendez).

LIGHT TRAP COLLECTIONS

ARIZONA - Mesa, 3/3-9, BL, ARMY CUTWORM (Euxoa auxiliaris) 1, BEET ARMYWORM (Spodoptera exigua) 64, BLACK CUTWORM (Agrotis ipsilon) 3, VARIEGATED CUTWORM (Peridroma saucia) 69, YELLOWSTRIPED ARMYWORM (S. ornithogalli) 8. FLORIDA - Gainesville, 3/7-13, BL, ARMYWORM (Pseudaletia unipuncta) 10, black cutworm 3, GRANULATE CUTWORM (Feltia subterranea) 32, SALTMARSH CATERPILLAR (Estigmene acrea) 3, yellowstriped armyworm 1. NEW MEXICO - Dona Ana County, 3/7-14, BL, army cutworm 7, beet armyworm 31, variegated cutworm 21.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1974
(Continued from page 192)

COTTON

Highlights:

BOLL WEEVIL migration continued through September in Tennessee and many fields had heavy damage to top-crop bolls, and heavy rains and poor treatment scheduling resulted in some heavy damage in North Carolina. A heavy boll weevil population overwintered in Alabama. BOLLWORMS caused some more-severe damage to cotton in North Carolina in 1974 than in 1973 because of heavy rains and inadequate control schedules, and overall damage in South Carolina was not much greater than in 1973. Bollworms were lighter than average in Arkansas, and unseasonably cool weather during September in Mississippi slowed egg and larval development. COTTON FLEAHOPPER was heavy in cotton in some areas of Texas and Oklahoma.

The first overwintered specimens of BOLL WEEVIL (Anthonomus grandis) emerged by mid-May in TENNESSEE and, in many cases, were waiting for cotton to emerge. Counts of punctured squares ranged 0-8 percent resulting from feeding and oviposition of overwintered weevils. First-generation weevils began emerging in early cotton about mid-July in the western area and the last week of July in the central area. More than 50 percent of the fields found infested were at control levels during the week ending July 19. Punctured-square counts continued to increase slowly in late July and early August. Rains during this period made controls difficult. Second-generation weevils began emerging by mid-August. By late August, populations in many fields were at a "runaway" status. Rains continued to make controls difficult and migration to rank fields had begun. Migration continued through September and many fields had heavy damage to top-crop bolls.

Overwintering boll weevils began emerging from litter during early April in the major cotton-producing counties of NORTH CAROLINA. Collections began decreasing June 17 after record sex-lure trap catches. Catches of 20+ weevils per trap per day were not uncommon from May 6 to June 10 in Northampton, Hertford, Johnston, Cumberland, and Sampson Counties. Catches in Scotland and Robeson Counties during the same period remained less than 4 weevils per trap per day. About 4,068 acres were scouted weekly during July and August in Nash, Northampton, Halifax, and Edgecombe Counties. Generally, weevil damage increased during the last week of July and peaked the week of August 11-17, with 46 percent of the fields surveyed reaching threshold damage levels. Heavy rains and poor scheduling for aerial treatment resulted in heavy damage in some fields.

The first boll weevil of the season in SOUTH CAROLINA was trapped in Calhoun County the last week of April. Trap catches indicated heavier populations in fields which were picked last in 1973. By mid-June, 12-percent square damage was reported in some fields across the State. In most counties, emergence was still rather light by the third week of June. Migration was well underway by the first of July and in fields where the recommended treatment schedule was not followed. In these fields, infestations caused 50

percent square damage. Adequate control was followed by those growers who followed recommendations made throughout 1974.

Live boll weevil counts on presquare cotton on 38 farms in 10 counties showed a heavy population had successfully overwintered and entered cotton throughout ALABAMA. First adults of the season were taken in sexlure traps during the week of April 24 to May 1 in Autauga, Tuscaloosa, and Fayette Counties. The first infestations in cotton were noted May 14 and 15 in Covington, Dallas, and Autauga Counties. An average of 12 treatment applications was used statewide on 605,000 harvested acres of cotton with an average yield of 452 pounds per acre, an increase of 29 pounds from 1973. With treatments applied later than usual in the season and an early freeze in October in the northern area, it is assumed fewer weevils entered hibernation than during the past 2-3 years.

An average of 404 live boll weevils per acre went into hibernation in Washington County, MISSISSIPPI, in fall 1973. This is below any other fall since records were started in 1956. Leggett traps placed in a nondiapause area of Yalobusha County in spring 1974 indicated weevils began leaving overwintering quarters the second week in April. Peak emergence occurred in mid-May when an average of 25 weevils per trap was taken. Another peak of 20 per trap occurred the first week in June. Feeding and egg punctures were first found in Noxubee, Chickasaw, Calhoun, and Webster Counties the week ending June 14. First-generation weevils began emerging from fallen squares the second week in July with peak emergence July 19-22. During peak weevil activity in July and August, punctured squares ranged 2-60 percent in fields depending on type of controls used.

The overwintering boll weevil survey in ARKANSAS was conducted in 15 counties with in-field traps operated during the period May 20 to June 24. A total of 2,025 specimens was taken in 570 weekly trap readings. This is an average of 3.55 weevils per trap per week. Peak populations occurred during the week of May 27 compared to the week of June 11 in 1973. Infestations were light compared to a longtime average. This allowed treatments to be applied later than normal and aided in decreasing total treatments. Pheromone traps in Jackson County, OKLAHOMA, showed boll weevil adults were active from early May through November. First punctured squares were found the last week of June. A few counts above 25 percent were found in Jackson County by early July, in several south-central, east-central, and southeast counties by mid-July. Scattered heavy infestations were present in all areas by early August and continued into October with counts up to 80 percent reported in Kiowa County in mid-September.

The first large scale boll weevil emergence in TEXAS was reported from the lower Rio Grande Valley during early June. Populations were also reported from "hotspots" in the south-central area during the week ending June 14. By the end of the month, heavy infestations were noted in parts of Hill, Navarro, and McClennan Counties. Overwintered populations were noted in older cotton in Fisher, Jones, Knox, and Wilbarger Counties. Activity was observed to be increasing rapidly in most infested areas by the first week of July.

BOLLWORM (Heliothis zea) and TOBACCO BUDWORM (H. virescens) eggs were observed July 30 and 31, and larvae the first week of August in the scouting area comprised of 4,068 fields (38,568 acres) in Nash, Halifax, Northampton, and Edgecombe Counties, NORTH CAROLINA. The first peak occurred August 10 when 22 percent of the fields scouted were at or above the threshold level. A second and more severe population peak occurred August 24-30 when about 65 percent of the fields scouted were at or above the threshold level. Heavy rains and poor scheduling for aerial treatment allowed more severe damage in some fields than occurred during the extremely heavy Heliothis spp. population pressures experienced during 1973.

Heavy to very heavy egg and larval infestations of H. zea and H. virescens developed on cotton throughout central SOUTH CAROLINA by early June. This was 30 days earlier than usual. Some fields had 40 eggs per 100 terminals and 25 larvae per 100 squares, with larvae ranging from 0.5 to one inch long. In mid-July, eggs ranged 80-90 per 100 terminals and newly hatched larvae ranged 40-50 per 100 plants exami ed. Due to frequent showers, some difficulty in treatment was encountered. Moth catches peaked the week of July 28. Bollworm populations decreased in August and September. Even though heavy bollworm populations developed early, the overall damage throughout 1974 was not significantly greater than that of 1973. Bollworm larval collections were taken from treated fields throughout the growing season in Calhoun County. A total of 1,268 larvae were collected, of which 1,076 were H. virescens and 192 were H. zea.

Heliothis spp. egg counts were generally light (0-5 percent) throughout MISSISSIPPI through mid-July when eggs and larvae began to surpass economic levels. Many fields were being treated at this time. The second generation on cotton began the last week in July and by the first week in August, some fields in the hill sections were running 50 percent eggs in terminals. By mid-August, some areas were experiencing local troublesome populations of H. virescens. In Grenada and Yalobusha Counties, larvae collected were 90 percent H. virescens. Another moth flight occurred the last of August and egg counts ranged up to 100+ per 100 terminals in Noxubee, Lowndes, Rankin, Madison, and Calhoun Counties. Unseasonably cool weather occurred in September and slowed egg and larval development.

Infestations of H. zea and H. virescens were lighter than average in ARKANSAS. Moth survey was increased by greater use of light traps and sugar lines. The sugar line is more effective June to early to mid-August after which light traps are more effective. Of 2,527 specimens determined, 1,657 were H. zea and 870 were H. virescens. Almost all larval specimens were collected in the southern area and in the upper Arkansas River Valley where H. virescens is heavier than in other areas. H. virescens followed the typical trend in that it was 15 percent the first half of July, decreased to 11 percent the last half, and then increased consistently to 95 percent of collections during the last half of September.

First H. zea eggs of the season on cotton in OKLAHOMA were found in Grady County in mid-June. Numbers were generally light through mid-July but increased during late July. In August and September, damaged square counts ranged up to 30 percent in the southwest and west-central counties, and up to 25 percent in the east-central and southeast counties. Heaviest damage in most areas occurred in August. H. virescens infested cotton in Jackson County, Oklahoma, by the second week of July. By mid-August, the Heliothis spp. population was 90 percent H. virescens in Tillman, Caddo, and Washita Counties, 50 percent in Grady County, 30 percent in Jackson County, and 25 percent in Wagoner, Muskogee, and McCurtain Counties. By early September, H. virescens had increased to 70 percent of the population in Wagoner and Muskogee Counties.

The first H. zea moth was collected April 17 at a blacklight trap in NEW MEXICO. Egg counts on cotton by early July ranged 3-10 per 100 plants in Dona Ana County. Cotton near Hobbs, Lea County, sustained moderate damage with 1-3 larvae per plant noted during the second week of July. Egg counts ranged 2-4 per 100 plants in Dona Ana County in mid-July and up to 11 per 100 plants in late July. Larvae in squares ranged up to 8 per 100 plants. Twelve damaged bolls per 100 plants were observed in Lea County by September 27. H. zea developed economic populations on 111 acres in Nye County, NEVADA, in July and treatments were made.

BEET ARMYWORM (Spodoptera exigua) infestations ranged moderate to heavy in cotton in Jackson and Greer Counties, OKLAHOMA, from late August to late September. Some square damage was reported. Larvae caused some damage in scattered areas throughout SOUTH CAROLINA with some localized heavy damage occurring. In general, populations and resulting damage were much less than had been expected.

COTTON FLEAHOPPER (Pseudatomoscelis seriatus) infestations were generally light on cotton during late May throughout most south-central and central TEXAS counties. Although populations began to increase in the south-central area during mid-June, most infestations were termed noneconomic. Increased damage to cotton was noted by the week of June 21. Infestations of 80 per 100 terminals were noted in Hill County, while in general, averages ranged 10-25 per 100 terminals in the Rolling Plains. Heavy infestations, up to 3 per plant, were noted in some south-central counties by mid-July. During the same period, extremely light populations were noted in the Lubbock and Trans-Pecos areas. Populations decreased to a noneconomic level for the rest of the season. Cotton fleahopper was reported in cotton from early June to early September in OKLAHOMA. Scattered, heavy infestations were present in the southwest area by late June and the west-central area by mid-July. Very heavy counts of up to 300 per 100 terminals were found in Caddo and Washita Counties during August.

TARNISHED PLANT BUG (Lygus lineolaris) populations and damage were lighter than for the record-damage year of 1973 in ALABAMA. First infestations were noted on weeds and clovers along roadsides in the southern area May 16 and in the northern area May 22. The first infestation in cotton occurred June 12 in Limestone and Lawrence Counties. Preliminary estimates of damage and control costs to the 605,000 acres of cotton in the State will be near 45 million dollars, or two to three times the usual loss. Increased

problems with Anthonomus grandis (boll weevil), Heliothis spp. (bollworms), Trialeurodes abutilonea (bandedwing whitefly), and the high cost of insecticides were the major contributing factors to the high cost and loss factor in the State.

STRAWBERRY SPIDER MITE (Tetranychus turkestani) had caused light reddening of cotton leaves by the week of May 17 in NEW MEXICO. Dry, dusty conditions continued into late May and June, and mite damage became severe. Some fields were treated three times before controls were effective.

TOBACCO

GRANULATE CUTWORM (Feltia subterranea) was a minor problem in shade-grown tobacco (Type 62) fields in FLORIDA with no serious infestations noted, but heavily damaged about 15 acres of Type 14 flue-cured tobacco near Live Oak, Suwannee County, during spring. About a 25-percent stand loss was noted. Larvae severely damaged 10 acres of young tobacco at Trenton, Gilchrist County, and reduced a 5-acre planting in southern Alachua County during early May. Larval damage in tobacco plant beds was severe in spots scattered over the southern half of the Coastal Plain of NORTH CAROLINA. Reports were received from Wayne, Robeson, and Sampson Counties. Estimates of 1,000 square yards of tobacco plant beds lost were received from Robeson County. Spot samples in Wayne County revealed about 10 of 50 beds sampled were infested. Populations of 1 per square foot could heavily damage a plant bed in one night.

SOUTHERN GREEN STINK BUG (Nezara viridula) was moderate in a 10-acre planting of flue-cured (Type 14) tobacco during May at Gainesville, Alachua County. Many plants wilted. One specimen can cause a tobacco plant to wilt. N. viridula was more prevalent than in past years on flue-cured tobacco at Live Oak, Suwannee County, during May.

GREEN PEACH APHID (Myzus persicae) populations in MARYLAND were above the 1973 levels on tobacco. An estimated 60-80 percent of 27,000 acres required controls, with 45 percent of this acreage receiving preplant treatments for both aphid and flea beetle control. Yield losses ranged 4-10 percent with most averaging 5 percent. Significant activity started in mid-July with 40-60 percent of the untreated fields infested by late July. Populations increased in some tobacco fields in Pittsylvania County, VIRGINIA, July 2. On July 31, a heavy infestation was observed at Chatham, Pittsylvania County. Aphids later became a serious problem to tobacco growers in this area with populations ranging 10-20 per square inch. Numerous predators were evident. Lady beetle adults and larvae, syrphid fly larvae, and a few stilt bugs affecting aphid populations on tobacco were reported at Appomattox, Appomattox County, July 31. Extremely heavy M. persicae populations developed on tobacco in KENTUCKY in late July. Infestations were general and not confined to the tops of plants. Populations ranged 300-500 per plant in heavily infested areas in the southern part of the State and 300-400 per plant in the central area. A rapid population decline occurred August 15-20.

SUGAR BEETS

Pupation of overwintering SUGARBEET ROOT MAGGOT (Tetanops myopaeformis) larvae was first noted May 3 in Walsh County, NORTH DAKOTA. By May 17, pupation was 33 percent in Pembina County and 75 percent in Walsh County. By June 7, adult emergence was 10 percent in Pembina County and 28 percent in Walsh County. Peak adult emergence occurred in these counties June 24. By June 28, counts ranged 2-3 per plant in Pembina County and eggs were evident. By June 12, wilted plants were evident in Pembina County. Chemical treatments were ineffective in dry areas in these counties.

Adult HOP FLEA BEETLE (Psylliodes punctulatus) damage was evident on sugar beets in McKenzie County, NORTH DAKOTA, by May 24. Damage was widespread in Richland, Walsh, and Pembina Counties by June 7. Up to 4 beetles per plant were present by June 21. The effects of damage caused by adult feeding is not known.

TWOSPOTTED SPIDER MITE (Tetranychus urticae) populations on sugar beets in southern IDAHO necessitated general treatment for the first time. In the past, only isolated fields and parts of fields needed treating.

MISCELLANEOUS FIELD CROPS

Heavy SUNFLOWER BEETLE (Zygogramma exclamationis) infestations became evident the third week of June on seedling sunflowers in northwest MINNESOTA. Fields above 50 percent infested were few and scattered. Emergency clearance was requested and received for a previously restricted chemical to be applied to 100,000 acres of sunflowers with the dosage not to exceed two pounds per acre. This pest is most damaging to seedling sunflowers and sunflowers were past this stage before much treatment was necessary. Sunflower beetle adults were damaging sunflowers by June 21 in Cass County, NORTH DAKOTA. Eggs were evident in Grand Forks County at the rate of 30 per plant by this date. Eggs were hatching by June 28 in Traill County. By July 5, adult activity had subsided in Cass, Steele, Foster, Stutsman, and Barnes Counties. Heavy egg laying had occurred by this date. Larval controls had been applied by July 5. Oviposition was still evident in Pembina, Walsh, and Grand Forks Counties July 12. Much control was done in the Red River Valley for this species.

SUNFLOWER MOTH (Homoeosoma electellum) larvae caused extensive damage to sunflower fields in Faulk, Spink, and Brown Counties, SOUTH DAKOTA, during late July and early August. Larvae commonly ranged 10-18 per head.

VARIEGATED CUTWORM (Peridroma saucia) infestations in OREGON were noticeably lighter than in 1973 but economic larval populations still developed in Willamette Valley peppermint fields. Early instars averaged 2.8 per sweep near Jefferson, Linn County, in late June and larger larvae ranged 5-6 per square foot in Albany in mid-July. Adult counts in the central production area light

traps were very light and peaks of flight activity were not evident. Consequently, larval populations were light although up to 5.6 per sweep were found locally in some peppermint fields.

A WEEVIL (Apion occidentale), a new insect pest on sunflowers, was found in the Red River Valley of MINNESOTA. Larvae were found in the stem, usually near the base, of the plant. Only trace populations were noted. The economic impact of this weevil has not been determined.

REDBACKED CUTWORM (Euxoa ochrogaster) larvae were widespread in central OREGON peppermint plantings in Deschutes, Crook, and Jefferson Counties but there were no infestations as severe as those of 1972 and 1973. Early instar larvae were present in fields by mid-April in Jefferson County. The adult flight period ranged from June 19 to September 5, with the heaviest catch (300+ per week) during peak activity in late July.

POTATOES, TOMATOES, PEPPERS

Highlights:

The loss potential by EUROPEAN CORN BORER to peppers was heavy from mid-July to early September in Maryland. This pest was economic on potatoes in South Carolina. POTATO TUBERWORM has been eradicated in Michigan. GRANULATE CUTWORM was heavy on tomatoes in Florida. Poor treatment timing resulted in some economic COLORADO POTATO BEETLE counts in Maine potatoes, and populations have been heavy the past several years in Maryland with extensive damage in localized areas. This beetle completely defoliated some potato and tomato plants in Florida. Late treatments resulted in heavy populations in Michigan. GREEN PEACH APHID and POTATO APHID were very active on potato and tomato in Maryland. Green peach aphid was heavy on Idaho potatoes.

EUROPEAN CORN BORER (Ostrinia nubilalis) fruit infestations in untreated sweet peppers ranged 20-45 percent in western Sussex County, DELAWARE. Treatments in most commercial plantings were generally effective. The potential for heavy losses (20 percent or more) of peppers existed from mid-July until early September in all commercial production areas on the Eastern Shore of MARYLAND. Only scheduled treatment programs prevented such losses. This pest caused some economic damage to potatoes in Sumter County, SOUTH CAROLINA, in early May.

VARIEGATED CUTWORM (Peridroma saucia) larvae and light populations of Spodoptera ornithogalli (yellowstriped armyworm), Agrotis ipsilon (black cutworm), and Amathes c-nigrum (spotted cutworm) defoliated or severely damaged 200 of 500 acres of potatoes in St. Joseph County, INDIANA. This acreage had received weekly treatments. Shallow tubers were damaged by larvae which ranged up to 25 per square foot. P. saucia larvae (nearly full grown) damaged potato foliage at Antigo in Langlade County, WISCONSIN, in mid-July and by early August in the Rhinelander area of Oneida County. Prompt control measures prevented the problem from becoming serious. Peak first-generation flights of variegated cutworm occurred during the last part of June in the Willamette Valley of OREGON. Early instar larvae were first noted in potato fields

on Sauvie Island, Multnomah County, June 25. Up to 17 larvae per plant were noted here by mid-July. Defoliation in these fields and fields in Washington and Marion Counties was restricted to scattered plants. Infestations were generally too small and localized to justify treatment.

TOMATO PINWORM (Keiferia lycopersicella) infestations in seedlings in Manatee County, FLORIDA, greenhouses led to field plant damage with foliage and fruits damaged. Infestations on tomato were moderate, ranged 2-10 per plant during fall at Bradenton, Manatee County, and Immokalee, Collier County. This gelechiid was light on potato (1-5 per plant) during spring at Immokalee, moderate (5-10 per plant) at Dover, Hillsborough County, and Bradenton, and light (1-5 per plant) on eggplant at Immokalee during spring. Tomato was the most severely injured host. Some fields were so heavily infested during March and April in Hendry, Lee, and Collier Counties they had to be abandoned. The population was economic on tomatoes in the Homestead area during spring. Infestations in some plantings were very serious, apparently worse than in previous years.

Tomato pinworm ranged moderate to heavy on commercial field-grown tomatoes in Tulsa County, OKLAHOMA, during August. Heavy damaging infestations developed on tomatoes in Clark County, NEVADA, with populations and damage much greater than in previous years.

POTATO TUBERWORM (Phthorimaea operculella) infestations have been eliminated in Michigan due to the enforcement of the State quarantine in chipping plants, tomato hothouses, and on out-of-State potato shipments. Cooperation among industry, extension, and regulatory personnel has been excellent and accounts for the success of the quarantine.

BLACK CUTWORM (Agrotis ipsilon) larvae had damaged peppers in Waushara County, WISCONSIN, by the third week of June, and damage was noted in other counties by the end of the month. Infestations in pepper fruit in DELAWARE by FALL ARMYWORM (Spodoptera frugiperda) and S. exigua (beet armyworm) were considerably below last season's record damage. Most fields, including a large untreated check, had less than one percent of the fruit infested with these two species. GRANULATE CUTWORM (Feltia subterranea) was heavy, ranged 10-15 per 20 row feet, during the spring, light (1 per 20 row feet) during fall on tomato at Bradenton, Manatee County, and Immokalee, Collier County, FLORIDA. Cutworms fed on unstaked fruit.

COLORADO POTATO BEETLE (Leptinotarsa decemlineata) could be found wherever there were larger potato fields especially in central and southern MAINE. Only a few fields had economic populations, which apparently were due to poor timing of treatments rather than resistance. Adults and eggs were first noted on potatoes in DELAWARE during early May with infestations much lighter than last season, except on some tomatoes in Kent County during late-May and early June. Populations over the past several years have been heavy in MARYLAND where growers failed to maintain scheduled treatment programs. Treatments on potatoes ranged 1-2 during the season and only 1.2 on tomatoes and peppers. Without population suppression with insecticides, losses in all three crops would be 80-100 percent.

Leptinotarsa decemlineata heavily damaged potatoes in many fields in Accomack and Northampton Counties, VIRGINIA, by May 15. Yields in some fields were estimated to be down as much as 25 percent. On May 22, some first-brood larvae had completed growth and entered the soil for pupation. Many overwintering beetles were still present and were ovipositing, thereby assuring a continuous infestation. In general, infestations were 7-10 days ahead of normal seasonal cycles in Accomack and Northampton Counties. During the hot summer months, beetles became inactive but around July 12 signs of renewed activity were evident as the weather cooled. Although much less of a problem than in the spring, Colorado potato beetle still caused extensive damage in localized areas.

Colorado potato beetle was fairly common but overall damage was light on some untreated plantings of potato and tomato at Gainesville, Alachua County, FLORIDA, during April and early May. Some plants were completely defoliated. Populations in MICHIGAN were the heaviest when compared to the recent past. In most cases, this appeared to result from late treatment. Once treatments were made, control was obtained.

First evidence of Colorado potato beetle in WISCONSIN was observed the last week of June with one adult found in sweeping grain in Portage County. The following week, row ends of one potato field in this county contained up to 10 half-grown larvae per plant. By early August, there were scattered reports of minor damage to potatoes in the central and northeastern districts, with one field in Portage County having up to 5 adults per 10 sweeps well into the field. During August, several fields in Waupaca County had contained up to 2-4 larvae per stalk. While this pest has the potential for causing much damage to a field, no fields monitored during 1974 had losses severe enough to significantly reduce the yield.

Colorado potato beetle adults, eggs, and larvae were present in Walsh and Pembina Counties, NORTH DAKOTA, by June 12, and infestations were general with controls underway. Adults ranged up to 160 per 100 plants, eggs 4, and larvae 60. By August 2, adults ranged up to 104 per 100 sweeps in 33 percent of the potato fields in Grand Forks County. Activity began in early May in OKLAHOMA and damage to home garden potatoes occurred during May and June. Colorado potato beetle caused above-normal damage to potato fields and treatment was needed in many home potato and tomato patches in UTAH.

POTATO FLEA BEETLE (Epitrix cucumeris) averaged 20 per 100 sweeps in potato fields of Pembina County, NORTH DAKOTA, by July 12, while fields in Walsh County had populations of 48-2,000 per 100 sweeps. By August 2, 93 percent of the fields in Grand Forks County were infested with up to 700 adults per 100 sweeps.

PEPPER WEEVIL (Anthonomus eugenii) was light in FLORIDA, ranged 0-1 per pepper during spring at Immokalee, Collier County, and Dover, Hillsborough County, and light during fall on pepper at Dover. This weevil continued to damage peppers in eastern Palm Beach County and nearby counties, although most growers maintained adequate control with approved materials. Larvae and pupae heavily infested pepper pods at a Delray Beach farm that had received treatments up to 3 weeks previously.

GREEN PEACH APHID (Myzus persicae) and Macrosiphum euphorbiae (potato aphid) were very active in Somerset and Worcester County, MARYLAND, potato and tomato-production areas and required scheduled sprays and preplant treatments with systemic insecticides in order to prevent economic losses. By mid-July, M. persicae infested 50-80 percent of the pepper plants in most untreated fields in Wicomico, Dorchester, and Somerset Counties. These two species are constant threats in all areas where tomatoes, peppers, and particularly potatoes are grown commercially. Green peach aphid was evident on various vegetables and ornamentals in WISCONSIN, with damage heavier on home garden peppers and tomatoes than to commercial fields with regular treatment programs.

Alates of green peach aphid averaged 32 per 100 sweeps on potatoes in Grand Forks County, NORTH DAKOTA, in early August. Populations were heavy in western IDAHO potatoes. They were significantly heavy in some areas of the Magic Valley. Populations in the pest management action program area were the lightest ever measured. This is the first time practically no foliar applications of pesticides were made for this species in the eastern area. M. persicae was observed in commercial potato plantings throughout OREGON in early July. Alates in bait pans increased sharply in Malheur County during mid-July. Populations at some locations ranged 200-300 per trap July 17-27. Aphids ranged 1-3 per 50 bottom leaves in fields in Multnomah, Washington, and Marion Counties July 3-15. Infestations of varying severity were present in mid-July in the Klamath Basin of Klamath County.

POTATO APHID (Macrosiphum euphorbiae) was slightly heavier than Myzus persicae (green peach aphid) and was found on many weed hosts throughout WISCONSIN. In mid-August, counts in a Portage County potato field were up to 1 per sweep, while other fields in the northeastern and central districts rarely exceeded 5 per 25 sweeps. Toward the end of August, isolated fields in the central district had heavier counts but damage was very limited. Into September this aphid was very light over most of the State.

BEANS AND PEAS

Highlights:

LESSER CORNSTALK BORER was a major pest in Alabama all season. MEXICAN BEAN BEETLE was common on snap beans in Delaware and a significant decrease was noted in Maryland. Infestations were serious to lima and pole beans in Alabama. BEAN LEAF BEETLE and MEXICAN BEAN BEETLE were a continual problem on beans in Tennessee. Peas just emerging were damaged by PEA LEAF WEEVIL in Idaho. Early fields were moderately to severely damaged in Idaho and Washington. Conditions in Wisconsin were favorable for SEEDCORN MAGGOT winter survival. Disease caused up to 50 percent loss in some snap bean fields. Several hundred acres of beans and corn were replanted in Idaho. BEAN APHID treatments were made to several thousand acres of beans in Idaho.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) damaged southern peas in numerous truck gardens in Union, Alachua, Madison, and Santa Rosa Counties, FLORIDA, during May. Infestations in ALABAMA started early in the season and were of major concern all season. Damaging infestations occurred in home gardens northward to Morgan County. Lesser cornstalk borer damaged blackeye peas, cowpeas, and pinto beans in OKLAHOMA in several south-central, southwest, west-central, and northwest area counties from late July to late August.

MEXICAN BEAN BEETLE (Epilachna varivestis) adults were common on snap beans in Sussex County, DELAWARE, during early June. Populations were light on most commercial plantings except on late snap beans in some Sussex County areas. Populations in May and June appeared moderate to heavy and required an average of one preventive treatment per field in MARYLAND. Late-season snap beans and lima beans normally requiring an average of 3 treatments only required one. This significant decrease is the first within the past 3 years. E. varivestis became a serious pest to lima and pole beans throughout ALABAMA. It was a pest to a lesser extent to table peas. Populations were heavy and about the same as the past 5 years. Mexican bean beetle caused severe defoliation of snap beans in Bernalillo County, NEW MEXICO, in late August. This insect has not been observed in the south-central area since the mid-1940's.

BEAN LEAF BEETLE (Cerotoma trifurcata) and Epilachna varivestis (Mexican bean beetle) were a continuous problem on beans throughout the season in TENNESSEE.

PEA LEAF WEEVIL (Sitona lineatus) adults averaged up to one per sweep in alfalfa and clover in Latah and Nez Perce Counties, IDAHO, by April 19. Early spring infestations in 3 Nez Perce County peafields averaged 0.2 per plant. Damage was noted to have occurred on peas that were only 20-30 percent emerged. Similar winter pea infestations were noted in the area. By April 26, early spring and winter pea infestations in Nez Perce and Latah Counties averaged up to 0.7 per plant in individual fields. Damage on some early fields was moderate to severe (50-60 percent clamshell injury and 15-20 percent terminal growing point injury) and chemical treatment was required. The ability of light populations to cause moderate injury in spring peas was associated with cold, wet soil conditions and very slow pea emergence and growth. Adult migration from perennial legumes to spring-seeded peas was nearly complete by June 7. Oviposition and larval development in spring and winter peas were underway by October. Adult populations were more localized and lighter than in 1973. About 30,000 acres in eastern Washington and northern Idaho were treated in 1974. Early spring and winter pea infestations in Whitman County, WASHINGTON, averaged 0.7 adults per plant. Moderate to severe damage was noted in some early fields. Heavy adult populations were reported during midseason from dry peafields in Walla Walla County. Populations generally were much lighter in 1974, largely due to the previous wet fall and winter.

Conditions were favorable for winter survival of SEEDCORN MAGGOT (Hylemya platura) in WISCONSIN. A cool, wet spring favoring larvae and a root rot complex contributed to damage in some central

district snap bean fields from the end of May to the first week in June. Various Pythium diseases caused up to 50 percent loss in some snap bean fields after initial root feeding by larvae. Farmers planting beans after this pest and disease complex were identified added an additional recommended application of soil insecticide. This application, plus drier-than-normal summer months, combined to reduce the problem to later-planted bean fields. Seedcorn maggot caused several hundred acres of beans and corn to be replanted in southwestern and central IDAHO.

GREEN PEACH APHID (Myzus persicae) populations averaged 10 per leaf on snap beans by the end of August in Sheboygan County, WISCONSIN, with a field in Rock County also having moderate populations. The central and northeast districts, for the most part, had limited problems until early September when a relaxed treatment program in a Waushara County potato field allowed populations to build up to 15 per leaf, but was of little consequence since harvest was eminent. BEAN APHID (Aphis fabae) infestation prevention included the treatment of several thousand acres of beans in southwestern and central IDAHO.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) was probably more damaging to beans in CALIFORNIA than for several years due to a mild winter. It was also epidemic and damaging in many ornamentals. Chemical controls were ineffective.

COLE CROPS

CABBAGE LOOPER (Trichoplusia ni) was one of the two principal cabbage pests in the Belle Glade area of FLORIDA. In early spring, damage to cabbage was light but became heavy by June. This followed the 1973 pattern including a polyhedral virus becoming a big factor in reducing the population by late spring and early summer. Weekly treatments were needed on about 10,000 acres of cabbage in the Hastings area to prevent damage. About 65 species of beneficial insects were found in the area but no significant control was demonstrated. No resistance to insecticides was noted but T. ni should be watched as resistance to one chemical has been reported. T. ni was a pest of lettuce in the Everglades area of Palm Beach County through most of the growing season. T. ni and Pieris rapae (imported cabbageworm) were present in most cabbage fields in MICHIGAN. Treatments were effective in all cases, keeping damage to a minimum.

Cabbage looper larval damage to cruciferous crops from the first flight, while not extensive in WISCONSIN, was reported in Winnebago, Dane, Columbia, and Marquette Counties in early July. Eggs from the second-generation flight were first observed in a Rock County field August 8, with one-fourth grown larvae found in Columbia and Ozaukee Counties by mid-August. The second-generation moth flight was spread over an extended period until late August in the southern districts due to cool nights which reduced flights. By the first week in September, larvae became more active statewide with about 50 percent of the cabbage heads infested with one larva per head in one Racine County field. Catches in a pheromone trap in a Columbia County cabbage field were still evident into mid-September, with all sizes of larvae still noticed. While cabbage looper was fairly active in 1974, adequate controls in most commercial fields resulted in much less damage than to home gardens.

Trichoplusia ni and Brevicoryne brassicae (cabbage aphid) were present in CALIFORNIA and damaging to nearly all cole crops and required repeated treatments. T. ni was a major pest of lettuce, particularly in the coastal and desert areas.

IMPORTED CABBAGEWORM (Pieris rapae) infested all 800 acres of early spring cabbage in MARYLAND. To control this pest, 2-3 treatments were needed. Adults were first common throughout DELAWARE during mid-April and larval infestations in cabbage and other crucifers were generally heavy most of the season, especially in Sussex County. P. rapae damaged crucifers, mainly cabbage, in the Hastings area of Saint Johns County, FLORIDA. It was light in spring but became heavy following the T. ni (cabbage looper) peak. The P. rapae population was considered the heaviest in the last 3 years. Preventive treatments were needed to produce saleable cabbage. No resistance to the insecticides used was noted.

Imported cabbageworm moths were moderately heavy in Dane, Columbia, and Racine Counties, WISCONSIN, the second week in July, with eggs found in Dane and Racine Counties. Larvae ranged up to two-thirds grown in some Dane, Columbia, and Outagamie County cabbage fields 7 days later, and half-grown larvae were observed the last week of July in southeastern counties. Adults as well as eggs were observed statewide, with larvae up to one-third grown 7 days later. In early September, light populations of three-fourths grown larvae were present in some scattered cabbage fields. These larvae were more damaging to broccoli, caulifolower, cabbage, and brussel sprouts in home gardens than to commercially managed fields.

VARIEGATED CUTWORM (Peridroma saucia) moth flights in WISCONSIN were recorded in blacklight traps in the Hancock area of Waushara County by May 7 and at Antigo, Langlade County, June 11. Larval damage to cabbage plant terminals in the southeast district was reported late in June.

BLACK CUTWORM (Agrotis ipsilon) was very heavy on cabbage during January at Homestead, Dade County, FLORIDA. Light economic damage to cabbage was noted at Hastings, Saint Johns County, and was controlled readily by pesticide drenches. Damage to early growth stages of cabbage was noted in Palm Beach County. Larvae averaged one per two row feet on turnips and rutabagas at Gainesville, Alachua County, during January.

DIAMONDBACK MOTH (Plutella xylostella) larvae (up to half grown) were first observed in WISCONSIN in early July in the northern south-central district. Limited damage to cabbage was evident in early planted fields in the southeast area prior to the beginning of regular spray programs. Another generation was completed in August with little additional damage to cabbage. A few moths and larvae were still present in early September in scattered counties. Pupae were noticed by mid-September in Columbia, Racine, Kenosha, and Outagamie Counties.

The CABBAGE MAGGOT (Hylemya brassicae) situation in WISCONSIN was watched closely for possible damage to early cabbage transplants due to cool, moist spring weather. Many fields had just been planted in early May due to wet conditions preventing earlier planting. Few fields had much damage except for slight seedbed damage in the southeastern district. Succeeding generations did not cause noticeable damage to any established fields around the State. Due to moderate fall weather, it is suspected that an above-average number of larvae could have gone into the over-wintering pupal stage. How many of these pupae will be viable in spring 1975 depends on many conditions, particularly the severity of winter.

The first report of CABBAGE APHID (Brevicoryne brassicae) for the season in NEW YORK was made June 20. Large and numerous colonies were noted on transplant cabbage near Alton, Wayne County. Heavy populations were observed in many cabbage fields in the central area during the week of August 19-23. During the same period, this species was still considered a problem in some cabbage fields, in spite of control efforts, in Madison and Onondaga Counties.

Colonies of cabbage aphid occurred at a few locations in WISCONSIN prior to mid-July, but the first noticeable damage was observed at that time in Columbia County and 7 days later in the Racine and Kenosha County area. By early August, fields in the southeast area and in Rock County had colonies large enough to cause curling and yellowing of leaf tips. In August, an additional pesticide specifically for aphid control was necessary. Some fields, in the southern areas at least, had colonies of varying size on up to 30 percent of cabbage plants. Frequent treatments reduced populations and enabled cabbage to survive what early damage had been done.

GREEN PEACH APHID (Myzus persicae) damaged early growth stages of cabbage in Palm Beach County, FLORIDA. The population was generally light at Hastings, Saint Johns County, but sometimes increased on lower leaves of cabbage. Green peach aphid moderately infested a small planting of squash at Dover, Hillsborough County, in early April.

CUCURBITS

SQUASH VINE BORER (Melittia cucurbitae) infested the 5,000 acres of cucumber and squash grown in central and southern ALABAMA. Damaging populations occurred earlier than in most years.

STRIPED CUCUMBER BEETLE (Acalymma vittata) was troublesome in all areas of MARYLAND. Most of the damage again occurred between late May and early June when adults damaged emerging cucurbit seedlings in Dorchester, Caroline, Queen Annes, and Wicomico Counties. Populations ranged 2-8 adults per plant in the heaviest infested fields. An average of 2 treatments was required to keep populations suppressed.

SEEDCORN MAGGOT (Hylemya platura) caused the loss of several cucumber fields during spring in MICHIGAN. In most cases where damage occurred, seed treatments had not been made.

GENERAL VEGETABLES

BLACK CUTWORM (Agrotis ipsilon) larval populations and damage seemed to be about average during spring in MAINE. Blacklight trap collections during the first three weeks of August were heavier than in 1973 and counts of this species were heavier than all other moths collected during 1974. This could indicate greater problems in spring 1975.

The adult flight pattern of WHITE CUTWORM (Euxoa scandens) in 1974 was the same as the 2 previous years in MICHIGAN, however populations tripled, reaching about 3,000 during the peak period. Larval populations were similar to those of 1973 and, in most cases, damage was held to a minimum. This cutworm has yet to be found anywhere but in asparagus in Michigan and only in economic populations in Oceana County.

BANDED CUCUMBER BEETLE (Diabrotica balteata) adults sporadically damaged lettuce in the Everglades area of Palm Beach County, FLORIDA, during spring and fall. This beetle was more abundant than usual on winter vegetables in the Homestead area of Dade County.

A LEAFMINER FLY (Liriomyza trifolii) was very destructive to celery in FLORIDA, particularly during spring and was of more concern to growers than any other species on vegetables in the Everglades area of Palm Beach County. All approved insecticides gave inadequate control. Celery yeild was reduced, appearance affected, and stalks were fouled with puparia. Infestations were particularly damaging on young field-sown lettuce in the Everglades area.

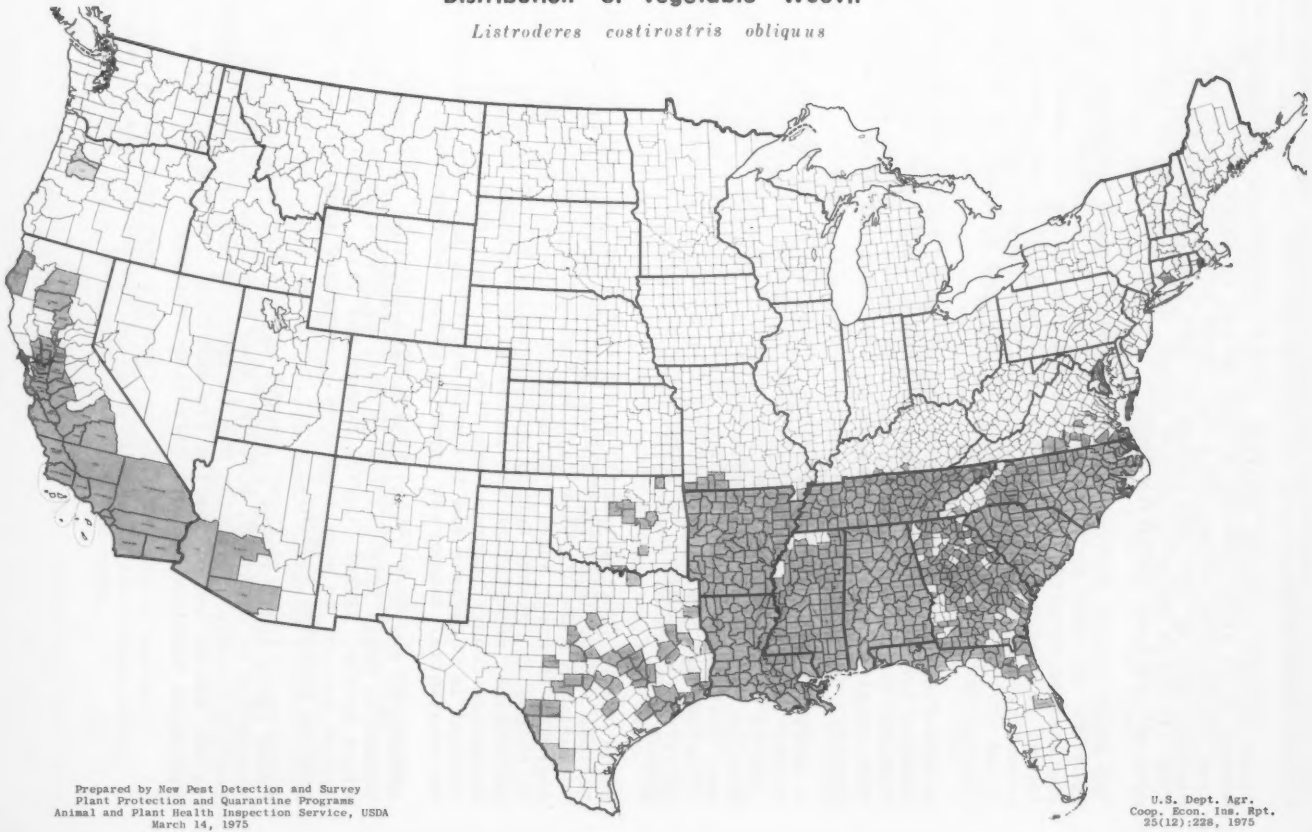
ONION THRIPS (Thrips tabaci) moved from dead and dying weeds into various susceptible crops during hot, dry weather in WISCONSIN, in early to mid-July when daytime temperatures reached 90+ degrees. In early August, infestation was severe in a small field of onions in Ozaukee County where treating was inadequate. By mid-August, infestation was moderate in a cabbage field in Outagamie County. Counts were light in other cabbage fields checked in Outagamie and Columbia Counties, but were consistent. No substantial damage was reported after mid-September.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) developed unusually heavy infestations on various vegetable plants in Clark County, NEVADA, during summer and fall, especially in the latter period. In many instances recommended chemicals did not provide adequate control.

GREEN PEACH APHID (Myzus persicae) was generally held in check on vegetables in MICHIGAN. However, some vegetable fields were heavily infested, probably due to improper applications, reduced rates, and/or use of ineffective materals. The use of soil systemics resulted in very effective control.

Distribution of Vegetable Weevil

Listroderes costirostris obliquus



Prepared by New Pest Detection and Survey
Plant Protection and Quarantine Programs
Animal and Plant Health Inspection Service, USDA
March 14, 1975

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
25(12):228, 1975

Collection Records of Bemisia tabaci (Gennadius) in the United States

(Hemiptera: Homoptera: Aleyrodidae)

Louise M. Russell 1/

The following information is presented in response to numerous inquiries concerning the distribution, hosts, and collection dates of Bemisia tabaci (Gennadius) in the United States. The records are based on specimens I have examined in the collection of the U.S. National Museum of Natural History. The collections are listed chronologically under each State. The data will aid investigators of this harmful species.

Bemisia tabaci is a serious pest in Central America and the West Indies, South America, Africa, and Asia. It is an efficient vector of diseases of numerous cultivated plants including beans, cassava, cotton, soybeans, and tobacco. The insect is a vector of leaf crumple virus of cotton in California (Laird and Dickson, Phytopathology, 49(6):324-327, 1959) and of sweetpotato mosaic in Georgia (Girardeau and Radcliffe, Plant Disease Reporter 44(1): 48-50, 1960). B. tabaci lives on numerous wild plants which serve as sources of infestation of cultivated plants. It is potentially injurious in warmer areas of the United States.

Arizona
- Gila Bend, cotton, 28-IX-1926
- East of Roll, Euphorbia sp., 22-IX-1959

California
- Calipatria, cotton, 16-X-1928
- Coachella, Ipomoea batatas, 17-IX-1947
- Indio, cotton, 1-X-1950, 17-II-1953, 21-X-1954
- Calexico, cotton, 4-IX-1951
- Coachella, cotton, 10-XI-1952
- Thermal, cotton, 17-18-II-1953
- Mecca, cotton, 17-18-II-1953, 15-XII-1953
- Imperial, cotton in greenhouse, III-1954
- Riverside, cotton in greenhouse, 7-VI-1954
- Riverside, Euphorbia sp. in greenhouse, 22-VI-1955
- Yucca Valley, Hibiscus sp., 8-XI-1961

District of Columbia
- Washington, Euphorbia heterophylla (presumably in greenhouse), 8-VI-1907

Florida
- Pomona, sweetpotato, 1-X-1894
- Bartow, okra, 15-VIII-1898
- Miami, Sonchus asper, 21-II-1908
- Brooksville, Duranta triacontia, 13-II-1922
- Clewiston, sweetpotato, 30-V-1949
- Quincy, Irish potato, 9-X-1949
- Ocoee, Sida sp., 17-VIII-1953
- Orlando, Sida sp., 18-I-1952, 16-X-1953
- Merritt Island, Sida sp., 15-IV-1954, 28-II-1957

1/ Systematic Entomology Laboratory, IIBIII, ARS, USDA, Beltsville, Maryland 20705.

Florida (Continued)

Indiantown, St. Lucie Canal, Sida sp., 15-IV-1954, 25-II-1956
Indiantown, St. Lucie Canal, Jerusalem-oak, 15-IV-1954, 25-II-1956
5 miles east of Indiantown, St. Lucie Canal, Sida sp., 25-II-1956
Marco Island, Sida sp., 11-V-1957
Apopka, Euphorbia pulcherrima, 6-XI-1957
St. Augustine, Eupatorium sp., XI-1958
Homestead, Sida sp., II-1959
Gainesville, sweetpotato, 20-VI-1959
Coral Gables, Euphorbia pulcherrima, 14-X-1959
Tampa, Euphorbia heterophylla, 3-XI-1959
Miami, Hibiscus roseus, 30-I-1961
West Palm Beach, Euphorbia sp., 29-XI-1961
Fern Park, Lantana sp., 4-IX-1962
Winter Haven, sweetpotato, 28-IX-1962
Pinellas Park, Euphorbia pulcherrima, 7-VII-1966
Lakeland, Ascyrum hypericoides, 2-XII-1970
Stuart, Euphorbia sp., 10-VI-1971
Tampa, Gerbera sp., IX-1971
Summerland Key, Bidens pilosa, 27-VI-1973
Gainesville, Mentha sp., 25-III-1974

Georgia
Tifton, sweetpotato, 19-VI-1950, 14-VIII-1956, 28-VIII-1959

Maryland
Beltsville, sweetpotato in greenhouse, 10-X-1959

Texas
Weslaco, Lantana sp., 23-IX-1946
Weslaco, Sida sp., 20-XI-1953
Weslaco, cotton, 21-XI-1959
Progresso, Wissadula amplissima, 18-VI-1960
Weslaco, Solanum integrifolium, 7-XI-1960
Weslaco, Althaea rosea, I-1961

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
25(12):229-230, 1975

Recognition Characters for Larvae of the Genus Zonosemata (Diptera, Tephritidae)

George C. Steyskal 1/

The genus Zonosemata includes the pepper maggot, Z. electa (Say), and Z. vittigera (Coquillett), two species which are widely distributed and abundant in the United States. There are also 4 other species which are so far known to occur only outside the United States: Z. minuta Bush (Jamaica), Z. cocoyoc Bush (S. Mexico), Z. vidrapennis Bush (S. Mexico), and Z. ica Steyskal (Colombia). According to Wasbauer (1972), the pepper maggot is known from a number of hosts, including various species of Capsicum (peppers), Physalis (husk tomato), Lycopersicon (tomato), and Solanum (eggplant and horse-neetles), while Z. vittigera is known only from Solanum elaeagnifolium (horse-nettle) and an undetermined species of Solanum. Nothing is known of the hosts of the other species.

The larvae of 3 species were described and keyed in Zonosemata in the basic work on tephritid larvae by Phillips (1946), viz., Z. electa (Say), Z. setosa (Doane), and Z. sp. The last, unnamed species has been recognized as Z. vittigera by Bush (1965) in his revision of the adults of the genus, but Z. setosa is now known as Rhagoletis basiola (Osten Sacken), a species whose larvae feed in the hips of various species of roses.

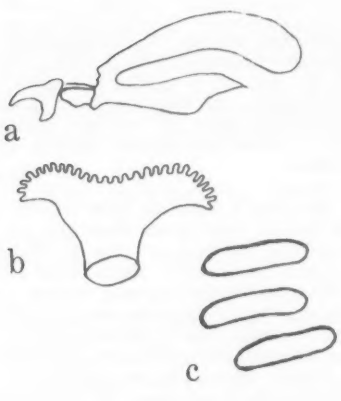
Examination of material in the U.S. National Museum has shown that Phillips' distinctions between the 2 North American species of Zonosemata are inaccurate and misleading. Larvae of the 2 species are much more similar to each other than Phillips' descriptions and figures indicate. Both species have whitish larvae which reach as much as 12 mm in length, having creeping spicules encircling all body segments, and are probably unique among North American tephritid larvae in having small, scattered depressions laterad and ventrad of the posterior spiracles. These structures, which resemble pockmarks, were termed punctate depressions by Phillips and only Z. electa was keyed as possessing them, whereas Z. sp. (= vittigera) was stated to have them "if present . . . elongate, in the form of lines or furrows." I find them in both species usually punctiform, but sometimes short-linear. There are also rows of closely spaced similar depressions in the bottom of grooves encircling the body segments. I also find that both species have a similar number and arrangement of the small tubercles on the caudal segment. Differences in the shape of the mouth hooks, anterior spiracles, and caudal segments are also less than indicated by Phillips. There are somewhat fewer tubules on the anterior spiracles in Z. vittigera, usually about 25, than in Z. electa, where I find usually about 28; I have seen none with 32. In specimens preserved in fluid and examined in air with the body surface allowed to dry, I find very little difference in the shape and structure of the caudal segment in the 2 species.

1/ Systematic Entomology Laboratory, IIBIII, ARS, USDA, Washington, D.C. Mail Address: c/o U.S. National Museum, Washington, D.C. 20560

The most dependable characters for recognition of the species seem to be the following (shown also in the accompanying figures):

Posterior spiracular slits nearly equidistant from each other and nearly parallel; cephalopharyngeal skeleton with dorsal wing considerably longer than ventral wing; mouth hooks proportionally smaller. . . . . Z. electa (Say)

Posterior spiracular slits with median slit more convergent toward and closer to lower slit than to upper slit; cephalopharyngeal skeleton with upper and lower wings of equal length; mouth hooks exceptionally robust. . . . . .Z. vittigera (Coquillett)



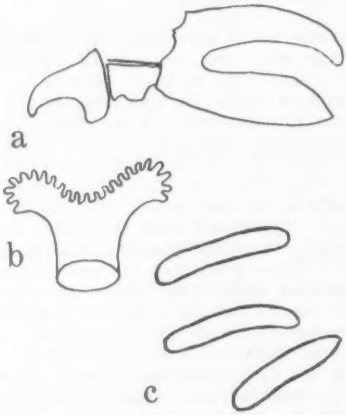


Fig. 1. Zonosemata electa (Say). Fig. 2. Zonosemata vittigera (Coquillett).

a - cephalopharyngeal skeleton; b - anterior spiracle; c - outline of left posterior spiracular slits.

Literature Cited

Bush, G.L. 1965. The genus Zonosemata, with notes on the cytology of two species (Diptera-Tephritidae). Psyche 72:307-323.

Phillips, V.T. 1946. The biology and identification of trypetid larvae (Diptera: Trypetidae). Mem. Amer. Ent. Soc. 12:1-161, pls. 1-16.

Wasbauer, M.S. 1972. An annotated host catalog of the fruit flies of America north of Mexico (Diptera: Tephritidae). Occas. Pap. Bur. Ent., Calif. Dept. Agric. 19:1-172.

Distribution Records of Several Virginia Shield Bugs

(Hemiptera: Scutelleridae, Corimelaenidae, Cydnidae, Pentatomidae)

William A. Allen 1/ and Richard L. Hoffman 2/

Twenty-five species are listed with 87 new county records. Unless otherwise indicated, all specimens were determined by R.L. Hoffman. All were adult specimens. The reference used for previously known distribution data was by Hoffman (1971). New county records are designated by an asterisk.

SCUTELLERIDAE

Homaemus parvulus (Germar). Specimens collected in Augusta County* by A.M. Woodside August 17, 1962 3/.

CORIMELAENIDAE

Corimelaena lateralis (Fabricius). Specimens have been collected in Cumberland County* by W.A. Allen August 13, 1974, and in Prince George* County by W.A. Allen August 13, 1974.

Galgupha aterrima Malloch. Specimens have been collected in The Independent City of Hampton* by W.A. Allen May 21, 1971 4/, and June 11, 1971 4/

Galgupha loboprosthesia Sailer. Specimens were collected in James City County* by an unidentified person July 6, 1961 4/

CYDNIDAE

Cyrtomenus ciliatus (Palisot de Beauvois). Two specimens were taken in Richmond County* by W.A. Allen July 10, 1974 5/.

Pangaeus bilineatus (Say). Specimens were collected in The Independent Cities of: Hampton* by W.A. Allen August 19, 26, 1970 4/ 5/, June 4, 1971 5/, and July 23, 30, 1971 5/; Norfolk by W. Tarpley August 15, 1961 4/ 5/, and July 3, 8, 31, 1962 4/ 5/; Portsmouth* by W.A. Allen July 25, 1974 5/; and Richmond* by W.A. Allen August 14, 1974 5/.

Banasa euchlora Stal. Specimens have been taken in: The Independent City of Virginia Beach* by W.A. Allen July 7, 1973 5/, June 5, 1974 5/, and August 6, 1974 5/; The Independent City of Hampton* by W.A. Allen August 27, 1970 4/; September 3, 1970 4/, and October 8, 1970 4/; Charlotte County by W.A. Allen July 16, 29, 1970, and Richmond County* August 3, 1970.

Brochymena quadripustulata (Fabricius). Specimens have been collected in: The Independent City of Virginia Beach* by W.A. Allen June 5, 18, 1974 5/; Charlotte County* by W.A. Allen July 16, 1970 5/; Montgomery County by R.L. Pienkowski October 31, 1974; Prince George County* by W.A. Allen May 24, 1961 4/; Roanoke County by W.D. Jones in June 1974 5/; and Westmoreland County* by M.A. Saucier October 6, 1974.

Cosmopepla bimaculata (Thomas). Adults have been collected on oats in Montgomery County by G. Clement June 20, 1974.

Euschistus servus (Say). Specimens have been collected in: The Independent City of Hampton* by W.A. Allen July 9, 1971 5/; The Independent City of Portsmouth* by R. Bowden September 30, 1974; The Independent City of Suffolk by W.A. Allen July 24, 1972, and T. Szarzynski September 26, 1974; The Independent City of Virginia Beach July 3, 23, 1973 5/; Albermarle County by W.A. Allen August 6, 1974; Appomattox County* by J. Sweet July 15, 1974, and by J.S. Smith August 12, 1974; Bedford County* by W.A. Allen August 12, 1974; Caroline County* by V. Hoyos August 15, 16, 1974; Cumberland County* by W.A. Allen August 12, 1974; Fairfax County by V. Hoyos August 6, 1974; Halifax County* by B. Hill July 12, 23, 1974; Isle of Wight County by W.A. Allen August 13, 1974; King and Queen County* by W.A. Allen July 30, 1974; King George County* by V. Hoyos August 20, 1974; Lee County* by H. Snodgrass June 19, 1974; Louisa County* by W.A. Allen July 9, 1973, and by V. Hoyos July 29, 1974; Mecklenburg County* by B. Hill July 23, 1974; Middlesex County* by W.F. Tate August 14, 1974; Montgomery County by P. Larkins August 12, 1974; Northumberland County* by W.A. Allen August 7, 1974; Orange County* by W.W. Surles August 11, 1974; Pittsylvania County* by G. Clement during summer 1974; Prince George County* by W.A. Allen August 13, 1974; Pulaski County* by W.W. Surles and K.J. Surles July 31, 1974, host Carduus nutans; Richmond County* by W.A. Allen July 28, 1970 4/ September 22, 1970 4/, and August 7, 1974; Scott County* by W. Tarpley July 3, 1963 4/; Southampton County* by C.R. Whitley August 1, 1974; Spotsylvania County* by V. Hoyos July 23, 25, 1974; Stafford County* by W.W. Surles and K.J. Surles August 10, 1974; Surry County* by J.H. Daughtrey August 1, 1974; and Westmoreland County* by W.A. Allen July 30, 1974, and by M.A. Saucier October 6, 1974.

Euschistus variolarius (Palisot de Beauvois). Specimens have been collected in: The Independent City of Hampton* by W.A. Allen June 25, 1971 5/; The Independent City of Suffolk* by W.A. Allen September 4, 1970, and October 5, 1970; Fairfax County by M.A. Saucier July 24, 1974; Isle of Wight County* by W.A. Allen July 2, 1974; Richmond County* by W.A. Allen July 28, 1970 4/, and September 3, 4, 22, 1970 4/; and Stafford County* by W.W. Surles and K.J. Surles August 10, 1974.

Euschistus tristigmus (Say). Specimens have been collected in: Isle of Wight County by W.A. Allen July 2, 1974; Louisa County* by V. Hoyos August 2, 1974; Powhatan County* by W.A. Allen August 12, 1974; Pulaski County* by W.W. Surles July 31, 1974; and Stafford County* by W.W. Surles and K.J. Surles August 10, 1974.

Holcosthetus limbolarius (Stal). Specimens were collected in: The Independent City of Hampton* by W.A. Allen October 8, 1970 4/; Caroline County* by V. Hoyos August 16, 1974; and in Montgomery County by G. Clement June 20, 1974. Hoffman (1971) erroneously listed this species under the genus Peribalus.

Hymenarcys nervosa (Say). Specimens have been collected from: The Independent City of Hampton* by W.A. Allen July 23, 1971 5/; The Independent City of Virginia Beach* by W.A. Allen June 23, 1973 5/; and Caroline County* by J. Norment June 10, 1974.

Menecles insertus (Say). Specimens have been collected in Charlotte County* by W.A. Allen July 28, 1970 4/, and from Richmond County* by W.A. Allen July 2, 1970.

Murgantia histrionica (Hahn). Specimens have been collected in Dinwiddie County* by S. Jennings September 19, 1972; Montgomery County by W. Tarpley September 2, 1962; Prince Edward County* by W.A. Allen September 15, 1971; Stafford County* by R.C. Beck August 5, 1974; and Westmoreland County 6/ by W.A. Allen July 23, 1969, and August 22, 1974.

Oebalus pugnax (Fabricius). Specimens were collected in: Bedford County* by W.A. Allen August 12, 1974; Mecklenburg County* by B. Hill July 23, 1974; and in Powhatan County* by W.A. Allen August 12, 1974.

Podisus maculiventris (Say). Specimens have been collected in: The Independent City of Chesapeake* by W.A. Allen July 11, 1973, and June 13, 1974; The Independent City of Virginia Beach by W.A. Allen July 10, 25, 1974; Charlotte County* by W.A. Allen July 28, 29, 1970 4/; Fairfax County by W.A. Allen June 17, 30, 1971 5/; Isle of Wight County* by W.A. Allen July 2, 1974; Powhatan County* by W.A. Allen August 12, 1974; Pulaski County by W.W. Surles July 31, 1974; Spotsylvania County* by V. Hoyos July 23, 1974; and Stafford County* by W.W. Surles and K.J. Surles August 10, 1974.

Sehirus cinctus cinctus (Palisot de Beauvois). Specimens have been collected in: Isle of Wight County* by R.D. Goerger June 8, 1973; James City County by an unidentified person July 6, 1961 4/; King George County* by W. Tarpley May 3, 1961 4/; and Westmoreland County by W.A. Allen July 3, 1974 and August 22, 1974.

PENTATOMIDAE

Acrosternum hilare (Say). Adult specimens have been collected in: The Independent City of Suffolk 6/ by W.A. Allen July 29, 1974, and by T. Szarznski September 26, 1974; The Independent City of Virginia Beach by W.A. Allen June 5, 11, 15, 18, 1974 5/, and August 20, 1974 5/; Albermarle County June 15, 1974, by B. Wilkins; Caroline County 6/ June 7, 1974, by J. Norment; Charlotte County 6/ by W.A. Allen July 29, 30, 1970 5/, and August 2, 1970 5/; Essex County* by W.F. Tate September 10, 1974; Gloucester County* by W.F. Tate August 15, 1974; Page County* by L. Koontz August 8, 1966; Richmond County 6/ by W.A. Allen July 29, 31, 1970 5/, August 2, 3, 9, 12, 1970 5/, and August 7, 1974; Roanoke County by G. Clement July 19, 1974; Southampton County* by C.R. Whitley July 2, 22, 1974, and August 3, 14, 1974; Spotsylvania County 6/ by V. Hoyos July 23, 1974; Surry County* by J.H. Daughtrey August 1, 1974; Washington County* by B.M. Saunders June 20, 1974; and Westmoreland County* by W.A. Allen August 22, 1974.

Banasa dimidiata (Say). Adult specimens were collected in: The Independent City of Richmond* by J.R. Tate August 1, 1973; The Independent City of Virginia Beach by W.A. Allen June 11, 1973, September 4, 1973, and June 11, 1974; and in Nansemond County by W.A. Allen August 7, 1972.

Stiretrus anchorago fimbriatus (Say). Specimens were collected in Northumberland County* by W.A. Allen August 7, 1974.

Thyanta calceata (Say). Specimens were collected in Pulaski County* by W.W. Surles and K.J. Surles July 21, 1974. The host was Carduus nutans.

Thyanta pallidovirens accera McAtee. Specimens were collected in: The Independent City of Hampton* by W.A. Allen June 4, 25, 1971; Caroline County* by V. Hoyos August 15, 1974; Charlotte County* by W.A. Allen July 16, 29, 1970 4/ 5/; Pittsylvania County by G. Clement in summer 1974; Powhatan County* by W.A. Allen August 12, 1974; and in Richmond County* by W.A. Allen July 28, 1970.

Trichopepla semivittata (Say). Specimens were taken in Cumberland County* by W.A. Allen August 12, 1974, and in Prince George County* by W.A. Allen August 13, 1974.

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Hoffman, R.L. 1971. Shield Bugs (Hemiptera: Scutteroidea: Scutelleridae, Corimelaenidae, Cydnidae, Pentatomidae) Virginia Polytechnic Institute Res. Div. Bul., pp. 1-61, illus.

1/ Extension Specialist, Insect Survey, Department of Entomology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

2/ Professor of Biology, Department of Biology, Radford College, Radford, Virginia 24141.

3/ Determined by W.A. Tarpley, Department of Biology, East Tennessee State University, Johnson City, Tennessee.

4/ Determined by R.C. Froeschner, Department of Entomology, Smithsonian Institute, Washington, D.C.

5/ Collected in a blacklight trap.

6/ Species previously reported without voucher specimens.

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
25(12):233-236, 1975

WEATHER OF THE WEEK ENDING MARCH 17

Reprinted from Weekly Weather and Crop Bulletin supplied by National Weather Service, NOAA.

HIGHLIGHTS: A series of waves along a front dangling across the South triggered treacherous combination of rain, snow, sleet, and freezing rain across widespread areas from Missouri and Arkansas over the Appalachinas to the Atlantic seaboard last week. Two of the wettest cities were Memphis, Tenn., with 4.74 inches and Greensboro, North Carolina, with 5.15 inches of precipitation for the week. Torrential rains during the week flooded rivers from the southern Atlantic coast to eastern Texas and from the gulf coast across the Ohio Valley. Most of the Nation was colder than normal last week. A Canadian cold air mass dominating the central Plains kept temperatures there as much as 13 degrees below normal for the week.

PRECIPITATION: Monday, a storm front centered over the South caused widespread precipitation as warm, moist air surging upward from the Gulf of Mexico collided with cold air to the north. Thunderstorms occurred along a front in Tennessee, while snow fell from Ohio westward to Nebraska. Elsewhere, snow fell over Nevada, Colorado, Wyoming, Montana, and Idaho. Further west, a cold front triggered showers in California. The frontal system reamined near stationary along the southern gulf coast Tuesday causing scattered thunderstorms and dense early morning fog. Showers and thunderstorms triggered by the front extended eastward across the Gulf Coast States into the Carolinas. A developing weather system in southern Colorado stirred up a variety of weather over the Rockies, Plains, and Mississippi Valley. The storm brought heavy snow overnight to southern Colorado, while warmer air pushed northward bringing rain from the southern Plains into southern Kansas and Missouri. Wednesday, storm conditions intensified along a front stretching from southern Lake Michigan southward and southeastward. Moderate to heavy precipitation fell from Georgia to southern New York and throughout the Lakes area to Minnesota. A total of 18 tornadoes swept across Mississippi, Alabama, Tennessee, and Georgia. Elsewhere, another Low center invaded the Pacific Northwest triggering moderate rain along the Washington and Oregon coasts. Thursday, a cold front moved to eastern New England and meandered south-southwestward into the Gulf of Mexico just off Texas. The cold air was marked by a High pressure system centered in southern Minnesota. Moderate and occasionally heavy precipitation peppered with thunderstorms fell along and ahead of the front as it moved eastward. Rainfall in excess of an inch was recorded in only six hours in Alabama, Georgia, West Virginia, and Tennessee. Golfball-size hail struck parts of northern Mississippi, central Arkansas, southwest Louisiana, and southeast Texas during the afternoon and evening. Friday, a deep Low center in western Virginia, gradually drifting eastward, produced moderate to heavy rains across Virginia northeast to Pennsylvania and westward through Ohio. Meanwhile a Low pressure center just off Cape Cod near Nova Scotia packed snow over the Northern Atlantic Coast States into the central Appalachinas. The intense Low from Virginia inches along the east coast causing moderate to heavy snow in New England on Saturday. The storm dumped 3 to 6 inches of snow

in parts of western and northern New York, Vermont, and Maine. Sunday, as the Low moved off the east coast another Pacific frontal storm system invaded the west coast. Showers and rain dampened the West from Idaho to interior portions of southern California. Elsewhere, a lingering front in the Southeastern United States spread rain throughout Georgia and northern Florida.

TEMPERATURE: Monday afternoon, temperatures remained chilly over the North Central United States with many readings from single values into the 20's. In contrast, the sun warmed readings into the 70's near the gulf coast and over the Florida Peninsula. Tuesday morning, temperature contrasts ranged from 70 degrees in southern Texas and Florida to below zero in extreme northern Minnesota, Michigan, New York, and Maine. Wednesday, unseasonably cold air covered most of the Nation. Meanwhile, temperatures were mild for the season from the gulf coast to the lower Great Lakes. Minimum temperatures early in the morning ranged from 15 degrees below zero in Butte, Montana, to 76 degrees in parts of Florida. Most of Iowa and portions of adjacent States set new record lows on Thursday. Des Moines, Iowa, dropped to 2 degrees below, Madison, Wisconsin, 4 degrees below, and Sioux Falls, South Dakota, 14 degrees below. Spencer, Iowa, one of the coldest towns in the Nation, recorded 16 degrees below zero. Friday, unseasonably cold air replaced unseasonably warm air in the South Atlantic States during the morning. Minimum early morning temperatures ranged from 18 degrees below in Spencer, Iowa, to 76 degrees in Miami, Florida. Saturday morning, chilly air again covered most of the Nation, while the only subzero reading of minimum thermometers was 8 degrees below in Alpena, Michigan. Fort Wayne, Indiana, set a record low with 3 degrees above. Temperatures Sunday afternoon reached 25 degrees in Tahoe, California, and 59 degrees in Melbourne, Florida.

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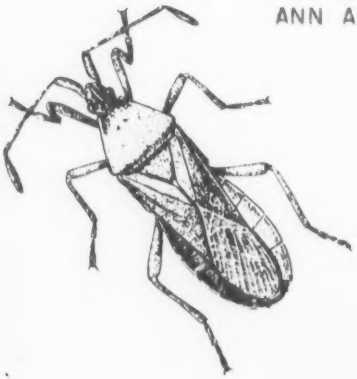
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